REMARKS

In view of the above amendments and the following remarks, reconsideration of the objection and rejections, and further examination are requested.

Claims 1-23 were pending in this application and stand rejected. Claim 19 has been objected to and has not been further treated on the merits. Claims 1-4, 6-8 and 10-23 are amended herein and claim 5 is cancelled herein. Thus, claims 1-4 and 6-23 are currently pending in this application. No new matter has been added.

The Examiner did not consider the reference listed in the Information Disclosure Statement (IDS) filed December 28, 2005 on the basis that it failed to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because the reference was not a legible copy. Thus, the Applicants are submitting herewith another IDS including a legible copy of the reference. Accordingly, the Applicants respectfully request that the Examiner officially consider the reference to make it of record in this application.

During a review of the specification and drawings, it was discovered that Figures 7 and 8 each required correction to be properly coordinated with the specification. Specifically, previous Figure 7 has been labeled as Figure 8, and previous Figure 8 has been labeled as Figure 7. New formal Figures 7 and 8 have been prepared and are submitted herewith, and include those changes detailed above.

The specification and abstract have been carefully reviewed and revised to make grammatical and idiomatic improvements in order to aid the Examiner in further consideration of the application. Amendments to the specification are contained herein. Moreover, a substitute Abstract including revisions has been prepared and is submitted herewith. Also submitted herewith is a marked-up copy of the Abstract indicating the changes incorporated therein. No new matter has been added.

On page 2 of the Office Action, the Examiner objected to a claim under 37 CFR § 1.75(c) as being in improper form on the basis that a multiple dependent claim should refer to other claims in the alternative only and cannot depend from any other multiple dependent claim. However, the Examiner did not identify a claim in the objection. While reviewing the Office Action, the Applicants discovered that the Examiner indicated claim 19 was objected to in the

SUBMISSION OF REPLACEMENT FORMAL DRAWING

Submitted herewith is a replacement drawing sheet for Figures 7 and 8 in order to better coordinate these figures with the specification. Specifically, previous Figure 7 has been labeled as Figure 8, and previous Figure 8 has been labeled as Figure 7.

Approval and entry of this replacement drawing sheet is respectfully requested.

Version with Markings to Show Changes Made

ABSTRACT OF THE DISCLOSURE (mark-up)

A method of computing a contour, such as the endocardial boundary in an ultrasound long-axis view of the heart, is disclosed. A plurality of points ~~are~~ is input, such that each point ~~being~~ is indicative of a predetermined landmark point in ~~the~~ an image. A preliminary contour is then derived based on the input points and a known average contour shape which has been obtained from a database of contours derived from previous images. Finally, the preliminary contour is deformed to fit features identified in the image by a feature-extraction algorithm, to obtain ~~the~~ a computed contour.

Office Action Summary sheet. Thus, the Applicants have amended claim 19 to depend from claim 1.

Accordingly, the Applicants respectfully request that the 37 CFR § 1.75(c) objection to claim 19 be withdrawn, and that claim 19 be further treated on the merits.

Claims 20 and 21 have been rejected under 35 U.S.C. § 101 on the basis that the claimed inventions are directed towards non-statutory subject matter. Moreover, the Examiner asserted that "a computer-readable medium" is neither defined nor supported by the Applicants' disclosure.

Claims 20 and 21 have been amended to recite statutory subject matter. Support for "a computer-readable medium" may be found in the specification on page 7, lines 1-7. Specifically, lines 2-3 recite "The software for performing a method embodying the invention is stored in data store 40 and executed by processor 42." The data store 40 corresponds to the "computer-readable recording medium" as recited amended claims 20 and 21.

Accordingly, the Applicants respectfully request that the 35 U.S.C. § 101 rejection of claims 20 and 21 be withdrawn.

Claims 1-9, 15 and 16 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Ladak et al. (U.S. Patent Application Publication No. 2004/0218797) (hereinafter referred to as "Ladak") and Lobregt et al. ("A Discrete Dynamic Contour Model") (hereinafter referred to as "Lobregt") in view of Cootes et al. ("Statistical models of appearance for medical image analysis and computer vision") (hereinafter referred to as "Cootes"). Claims 10-14 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Ladak, Lobregt and Cootes, and further in view of McInerney et al. ("Deformable Models in Medical Image Analysis: A Survey") (hereinafter referred to as "McInerney").

Independent claim 1 has been amended to distinguish over the references cited by the Examiner.

The above rejections are submitted to be inapplicable to amended claim 1 for the following reasons.

Claim 1 recites a method of computing a contour including, in part, deriving a preliminary contour based on input points and a known average contour shape by applying a

parametric model to transform the known average contour shape such that landmark points of the known average contour shape match corresponding input points.

In contrast to the present invention, Ladak does not disclose deriving a preliminary contour based on input points and a known average contour shape by applying a parametric model to transform a known average contour shape such that landmark points of the known average contour shape match corresponding input points.

Instead, Ladak discloses in lines 9-20 of paragraph [0028], automatically deforming a discrete dynamic contour (DDC) to fit features of interest (i.e., edges that define the boundary of the prostate) by automatically adding or deleting points from the DDC to allow it to better conform to a boundary of a prostate. However, Ladak does not disclose deforming the DDC such that the DDC points correspond to other input points. Moreover, there is no disclosure or suggestion in Ladak to modify the deformation of the DDC by transforming the DDC points to correspond to other input points that are not part of the DDC.

In other words, Ladak does not disclose deriving a preliminary contour based on input points and a known average contour shape by applying a parametric model to transform a known average contour shape such that landmark points of the known average contour shape correspond to the input points.

The Examiner asserted that Ladak discloses in paragraph [0028] the transformation of an initial contour (or outline) to a preliminary contour based on landmark points. However, as discussed above, the DDC points of Ladak are not edited to correspond to input points other than those that are part of the DDC, and thus Ladak does not derive a preliminary contour based on input points and a known average contour shape by applying a parametric model to transform a known average contour shape such that landmark points of the known average contour shape correspond to the input points.

Lobregt is relied upon in the rejection as disclosing that the DDC as used by Ladak can be successfully deformed based on any reasonably shaped initial contour. However, it is clear that Lobregt also fails to disclose or suggest the above-discussed features of the method of computing a contour as recited in claim 1.

Cootes is relied upon in the rejection as disclosing statistical shape analysis for the purpose of calculating contours and the development of a known "average contour" to use as an

initial contour for computation of similar contours from an image.

Cootes discloses synthesizing any image of normal anatomy from training examples using computational models, and optimizing the match between a synthesized model image and a target image (Abstract). An iterative approach is used to fit the synthesized model to an image by fitting the best nearby match for points X'_i. However, it is clear that Cootes also fails to disclose or suggest the above-discussed features of the method of computing a contour as recited in claim 1.

McInerney is relied upon in the rejection as disclosing using statistical models to guide deformable contours to find, segment, and measure the heart by its contours. However, it is clear that McInerney also fails to disclose or suggest the above-discussed features of the method of computing a contour as recited in claim 1.

For at least the reasons set forth above, it is respectfully submitted that one of ordinary skill in the art at the time the invention was made would not have modified Ladak in such a manner as to result in, or otherwise render obvious, the invention of claim 1. Therefore, it is respectfully submitted that claim 1, and claims 2-4 and 6-23 depending therefrom, are clearly allowable over the prior art of record.

In view of the foregoing amendments and remarks, all of the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action are respectfully solicited.

Should the Examiner believe there are any remaining issues that must be resolved before this application can be passed to issue, it is respectfully requested that the Examiner contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

Miguel MULET PARADA et al.

By: Kevin McDermott

Kevin McDermott
Registration No. 48,113
Attorney for Applicants

KM/MSH/km
Washington, D.C. 20006-1021
Telephone (202) 721-8200
Facsimile (202) 721-8250
April 28, 2008